



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/775,927	02/02/2001	Hisaya Ishihara	NECN 18.304	3865
26304	7590	01/25/2006	EXAMINER	
KATTEN MUCHIN ROSENMAN LLP			KIM, KEVIN	
575 MADISON AVENUE			ART UNIT	
NEW YORK, NY 10022-2585			PAPER NUMBER	
			2638	

DATE MAILED: 01/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

aa

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	09/775,927		ISHIHARA, HISAYA	
	<b>Examiner</b>		<b>Art Unit</b>	
	Kevin Y. Kim		2638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11-1-2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 5-7 and 9 is/are allowed.
- 6) ☒ Claim(s) 1-4,8,10,13 and 14 is/are rejected.
- 7) ☒ Claim(s) 11 and 12 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments with respect to claims 1-9 have been considered but are moot in view of the new ground(s) of rejection.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

### ***Claim Rejections - 35 USC § 102***

3. Claim 1, 2, 3, 13 and 14 are rejected under 35 U.S.C. 102(a) as being anticipated by admitted prior art.

#### **Claim 1.**

An admitted prior art, depicted in Fig.3, show a quadrature modulator, comprising;

a local oscillator (402) for oscillating at an oscillation frequency;

a frequency conversion block (301) for converting said oscillation frequency to output a converted oscillation frequency;

a quadrature modulation block (201) for receiving a baseband signal (from 101) and said converted oscillation frequency, the block including a first frequency divider (240,250) for dividing said converted oscillation frequency by a factor of two to output a pair of orthogonal signals having a phase difference of 90 degrees (250), first and second multipliers (210,220) for modulating said pair of orthogonal signals with said baseband signal to output a pair of modulated signals and an adder (230) for adding said modulated signals together to

Art Unit: 2638

output a carrier signal, wherein said carrier signal has a frequency different from said oscillation frequency and said converted oscillation frequency.

See page 3-4 of the present application.

Claim 2.

The admitted prior art (depicted in Figs. 3 and 5, and described at pages 3-8 of the present application) shows a quadrature modulator/method comprising:

- 1) a local oscillator (402) whose frequency  $f_{osc}$  is “ $4/(2N+1)$  times,” i.e.,  $4/3$  times where  $N = 1$ , of the carrier frequency  $f_{out}$ ,
- 2) a frequency conversion block (301 and 250) for multiplying the oscillating frequency by  $(2N+1)/2$ , i.e.,  $3/2$  where  $N = 1$ , see that the output of the frequency multiplier (250) is  $3/2 f_{osc}$
- 3) a first frequency divider (240) for dividing the output of the frequency conversion block by two to generate a pair of carrier waves, see the two output carrier waves from the frequency divider (240)
- 4) first and second multipliers (210 and 220) for modulating the two carrier waves with a digital baseband signal (101) and
- 5) an adder (230) for adding the two modulated carrier waves to output a digital carrier signal  $f_{out}$ , wherein the frequency conversion block includes a second frequency divider (310) for dividing said oscillation frequency by a factor of two to generate a divided frequency, a frequency mixer (320) for mixing the outputs from the local oscillator (402) and the frequency divider (350) to generate a first signal having a frequency equal to sum

Art Unit: 2638

of the oscillation frequency and the divided frequency. Note that a frequency mixer generates a sum and a difference of two input frequencies.

Claim 3.

Since the frequency mixer produces the sum and difference frequencies, a bandpass filter (330) is required to filter out the undesired difference frequency.

Claim 10.

Fig.3 of the present application further shows the frequency conversion block includes a second frequency divider (310) for dividing said oscillation frequency by a factor of two to generate a divided frequency, a frequency mixer (320) for mixing the outputs from the local oscillator (402) and the frequency divider (350) to generate a first signal having a frequency equal to sum of the oscillation frequency and the divided frequency. Note that a frequency mixer generates a sum and a difference of two input frequencies.

Claim 13.

An admitted prior art, depicted in Fig.3, show a method comprising the steps of:  
generating an oscillation frequency (402);  
converting said oscillation frequency to output a converted oscillation frequency (301);  
dividing said converted oscillation frequency by a factor of two to output a pair of orthogonal signals having a phase difference of 90 degrees (250);  
modulating said pair of orthogonal signals with a baseband signal to output a pair of

Art Unit: 2638

modulated signals (210,220); and

adding said modulated signals together to output a carrier signal (230),  
wherein said carrier signal has a frequency different from said oscillation frequency and  
said converted oscillation frequency.

See page 3-4 of the present application.

Claim 14.

The admitted prior art also describes that the converting operation removes an image  
signal from "said first signal" using a bandpass filter. See page 4, lines 4-6.

***Claim Rejections - 35 USC § 103***

4. Claims 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior  
art in view of Lindenmeier et al (US 6,011,962).

The admitted prior art discloses all the subject matter claimed, as explained above in  
connection with claim 2, except for the frequency mixer is a double-balanced mixer.

Lindenmeier et al teaches that a double-balanced mixer suppresses spurious signals at its  
output. See col. 4, lines 18-26. Thus, it would have been obvious to one skilled in the art at the  
time the invention was made to use a double-balanced mixer as the frequency mixer of the  
admitted prior art for the purpose of generating an output signal without spurious signals.

5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior  
art in view of Landefeld (US 3,644,827 previously cited).

The admitted prior art discloses all the subject matter claimed except that “N is equal to or more than “2” ” and “N frequency mixers cascaded from one another” are used. However, a particular choice of N is an obvious matter of choice depending on what multiple of an oscillation frequency is used as the carrier frequency in the prior art modulator shown in Fig.3 and 5. Landefeld discloses a combination of an oscillator (2) and a plurality of serially-coupled frequency mixers (24,30,34,38) to generate a desired frequency by selecting a sum frequency. Thus, a selective combination of a serially connected frequency mixers and an oscillator in the prior art QAM modulator would have been obvious to one skilled in the art at the time the invention was made for the purpose of generating any desired modulation frequency

***Allowable Subject Matter***

6. Claims 5-9 are allowed.
7. Claim 11 and 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Y. Kim whose telephone number is 571-272-3039. The examiner can normally be reached on 8AM --5PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye can be reached on 571-272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2638

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*/Kevin Kim 1/28/06*

**KEVIN KIM**  
**PATENT EXAMINER**